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10/536,775	01/23/2006	Nigel Paul Schofield	M02B160	2847

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Edwards Vacuum, Inc.
2041 MISSION COLLEGE BOULEVARD
SUITE 260
SANTA CLARA, CA 95054

EXAMINER	
BOBISH, CHRISTOPHER S	
ART UNIT	PAPER NUMBER
3746	
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Please find below and/or attached an Office communication concerning this application or proceeding.

The time period for reply, if any, is set in the attached communication.

Office Action Summary	Application No.	Applicant(s)	
	10/536,775	SCHOFIELD, NIGEL PAUL	
	Examiner	Art Unit	
	CHRISTOPHER BOBISH	3746	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE *3* MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *30 March 2009*.

2a)☒ This action is **FINAL**. 2b)☐ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-17* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-17* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☒ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____ .
5) ☐ Notice of Informal Patent Application
6) ☐ Other: _____.

DETAILED ACTION

Response to Amendment

The arguments filed on 03/30/2009 under 37 CFR 1.131 have been considered but are ineffective to overcome the Breaux and Stones references.

Claims 1-17 remain pending in the application.

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breaux (US Patent No. 3,536,418) in view of Stones (US Patent No. 6,375,413 B1).

Breaux teaches:

From claim 1:

A vacuum pumping arrangement, FIG. 1, having a turbomolecular vacuum pumping means, FIG. 1 (10) C. 1 Line 70, having a motor, FIG. 1 (20) C. 2 Lines 10-11, and a drive shaft, FIG. 1 (12) C. 1 Line 71, an evacuation means, FIG. 1 (33), to evacuate the turbomolecular pump, C. 2 Lines 30-35,

Breaux does not teach a backing pumping mechanism, but Stones does.

Stones teaches:

limitations from claim 1, a backing mechanism, FIG. 1 (1) C. 5 Lines 28-29;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to combine the regenerative and molecular drag mechanisms taught by Stones with the turbomolecular pump taught by Breaux in order to create a pump capable of greater vacuums, C. 1 Lines 57-68 and C. 2 Lines 1-21;

Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Breaux (US Patent No. 3,536,418) in view of Stones (US Patent No. 6,375,413 B1).

Breaux teaches:

From claim 8:

A vacuum pumping arrangement, FIG. 1, having a turbomolecular vacuum pumping means, FIG. 1 (10) C. 1 Line 70, having a motor, FIG. 1 (20) C. 2 Lines 10-11, and a drive shaft, FIG. 1 (12) C. 1 Line 71, a method comprising operating

an evacuation means, FIG. 1 (33), to evacuate the turbomolecular pump to a predetermined pressure, C. 2 Lines 30-35, and operating a motor to rotate a drive shaft, C. 2 Lines 33-35;

Breaux does not teach a backing pumping mechanism, but Stones does.

Stones teaches:

limitations from claim 8, a backing mechanism, FIG. 1 (1) C. 5 Lines 28-29;

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to combine the backing mechanisms taught by Stones with the turbomolecular pump taught by Breaux in order to create a pump capable of greater vacuums, C. 1 Lines 57-68 and C. 2 Lines 1-21;

Claims 1-3, 5-7 and 15 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abbel (US Patent No. 6,446,651 B1) in view of Stones (US Patent No. 6,135,709).

Abbel teaches:

limitations from claim 1, a vacuum pumping system (see FIG. 1) having a turbomolecular pump (3), including an evacuation means (4) to evacuate the turbomolecular pumping means (C. 2 Lines 62-63);

Abbel does not teach the specific structure of the turbomolecular vacuum pump, but Stones does.

Stones teaches:

limitations from claim 1, a molecular pumping mechanism (FIG. 3) comprising turbomolecular pumping means (50); a backing pumping mechanism (1), wherein a drive shaft (the shaft mounted on the rotor 9) driven by a motor (7 from FIG. 1) is for driving the molecular pumping mechanism and the backing mechanism (C. 2 Line 61 to C. 3 Line 20);

It would have been obvious to one of ordinary skill in the art of vacuum pumps at the time of the invention to use a compound vacuum pump as taught by Stones in the system as taught by Abbel in order to improve the operating range of pressures and throughput (see C. 1 Lines 4-7 of Stones). Furthermore, as Abbel already teaches a turbomolecular pump, it would be obvious to one of ordinary skill to substitute various pumps of this type to meet performance (i.e. pressure) demands.

Abbel and Stones disclose and teach of the system in claim 1.

Abbel further teaches:

limitations from claims 2 and 3, wherein the vacuum pumping arrangement forms part of a semiconductor processing assembly (C. 1 Lines 12-33, semiconductor processing is a chemical/physical process), and the evacuation means (4) comprises a pump that is a pump for a load lock chamber (2, “gate chamber”) of the processing assembly (C. 2 Lines 53-65);

limitations from claim 7, wherein the evacuation means (4) is for evacuating the vacuum pumping arrangement (C. 2 Lines 62-65);

Abbel and Stones disclose and teach of the system in claim 1.

Stones further teaches:

limitations from claims 5, 6 and 15, wherein the backing pumping mechanism (1) is a regenerative pumping mechanism (C. 3 Lines 16-18); and the molecular pumping mechanism comprises a molecular drag pumping mechanism (2; see C. 3 Lines 14-16);

Claim 1 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al (US Patent No. 6,161,576) in view of Stones (US Patent No. 6,135,709).

Maher teaches:

limitations from claim 1, a vacuum pumping arrangement (see FIG. 1-3) comprising a vacuum means (roughing pump) connected to the arrangement to evacuate a turbomolecular pumping means (turbo-pump);

Maher does not teach the specific structure of the turbo pump, but Stones does.

Stones teaches:

limitations from claim 1, a vacuum pump arrangement having a molecular pumping mechanism (FIG. 3) comprising turbomolecular pumping means (50); a backing pumping mechanism (1), wherein a drive shaft (the shaft mounted on the

rotor 9) driven by a motor (7 from FIG. 1) is for driving the molecular pumping mechanism and the backing mechanism (C. 2 Line 61 to C. 3 Line 20);

It would have been obvious to one of ordinary skill in the art of vacuum pumps at the time of the invention to use a compound vacuum pump as taught by Stones in the system as taught by Maher in order to improve the operating range of pressures and throughput (see C. 1 Lines 4-7 of Stones). Furthermore, as Maher already teaches a turbomolecular pump, it would be obvious to one of ordinary skill to substitute various pumps of this type to meet performance (i.e. pressure) demands. Examiner also notes that while Maher does not teach a shaft explicitly, it is obvious, at the very least in the combination of Maher with Stones, that starting the turbo pump would require a rotation of its shaft.

Claim 4 and 16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Abbel (US Patent No. 6,446,651 B1) in view of Stones (US Patent No. 6,135,709) as applied to claims 1-3 and 5-7 above, and in further view of Olsen (US Patent No. 4,577,465).

Abbel and Stones disclose and teach of the method in claim 1.

Neither Abbel nor Stones teaches a specific type of pump to be used for the evacuation means (4 of Abbel), but Olsen does.

Olsen teaches:

limitations from claim 4, wherein an evacuation means (38) comprises an ejector pump (C. 5 Lines 40-60);

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to use an ejector pump as taught by Olsen in the system taught by Abbel and modified by Stones in order to avoid contamination from an oil lubricated pump, C. 2 Lines 20-30;

Abbel further teaches:

limitations from claim 16, wherein the evacuation means (4) is for evacuating the vacuum pumping arrangement (C. 2 Lines 62-65);

Claims 8, 9, 11, 13, 14 and 17 are rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al (US Patent No. 6,161,576) in view of Stones (US Patent No. 6,135,709).

Maher teaches:

limitations from claims 8 and 9, a method of operating a vacuum pumping arrangement (see FIG. 1-3), the method comprising the steps of operating a vacuum means (roughing pump) connected to the arrangement to evacuate a turbomolecular pumping means (turbo-pump) to a predetermined pressure; and operating a motor to start rotation of the turbomolecular pump shaft when the pressure has been obtained (C. 3 Line 57 to C. 4 Line 8);

Maher does not teach the specific structure of the turbo pump, but Stones does.

Stones teaches:

limitations from claims 8 and 9, a method of operating a vacuum pump arrangement having a molecular pumping mechanism (FIG. 3) comprising turbomolecular pumping means (50); a backing pumping mechanism (1), wherein a drive shaft (the shaft mounted on the rotor 9) driven by a motor (7 from FIG. 1) is for driving the molecular pumping mechanism and the backing mechanism (C. 2 Line 61 to C. 3 Line 20);

It would have been obvious to one of ordinary skill in the art of vacuum pumps at the time of the invention to use a compound vacuum pump as taught by Stones in the system as taught by Maher in order to improve the operating range of pressures and throughput (see C. 1 Lines 4-7 of Stones). Furthermore, as Maher already teaches a turbomolecular pump, it would be obvious to one of ordinary skill to substitute various pumps of this type to meet performance (i.e. pressure) demands. Examiner also notes that while Maher does not teach a shaft explicitly, it is obvious, at the very least in the combination of Maher with Stones, that starting the turbo pump would require a rotation of its shaft.

Maher and Stones teach and disclose of the method in claim 8.

Maher further teaches:

limitations from claims 11 and 13, wherein the vacuum pumping arrangement forms part of a semiconductor processing assembly (C. 1 Lines 12-17) having a pump (roughing pump) associated therewith which forms the evacuation means, further comprising the steps of connecting the pump to the arrangement (see FIG. 1-3) and operating the pump to evacuate the turbomolecular pumping

means and the vacuum pumping arrangement to the predetermined pressure (C. 2 Line 61 to C. 3 Line 20);

limitations from claims 14 and 17, wherein the predetermined pressure is 500 mbar or less (C. 1 Lines 30-42 discuss the need for pressures of 1 torr or less, which converts to less than 500 mbar);

Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al (US Patent No. 6,161,576) in view of Stones (US Patent No. 6,135,709) as applied to claims 8, 9, 11, 13, 14 and 17 above, and in further view of Arai et al (US Patent No. 6,474,949 B1).

Maher and Stones teach and disclose of the vacuum pumping arrangement of claim 8.

Maher teaches starting a turbo pump while running an evacuation means (roughing pump);

Neither Maher nor Stones teach limiting the torque of a motor during startup, but Arai does.

Arai teaches:

limitations from claim 10, limiting the torque of a motor (40), (Arai discloses controlling the speed of the motor, it would be obvious that speed and torque are closely related), to avoid an overloaded state, (C. 1 Lines 60-65 and C. 4 Lines 5-21);

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to combine the pump monitoring method as taught by Arai with the operating method taught by Maher and modified by Stones in order to create a more stable pumping arrangement.

Claim 12 is rejected under 35 U.S.C. 103(a) as being unpatentable over Maher et al (US Patent No. 6,161,576) in view of Stones (US Patent No. 6,135,709) as applied to claims 8, 9, 11, 13, 14 and 17 above, and in further view of Olsen (US Patent No. 4,577,465).

Maher and Stones disclose and teach of the method in claim 8.

Neither Maher nor Stones teaches a specific type of pump to be used for the evacuation means (roughing pump), but Olsen does.

Olsen teaches:

limitations from claim 12, wherein an evacuation means (38) comprises an ejector pump (C. 5 Lines 47-48), wherein the pump is connected to a vacuum arrangement to evacuate another pumping means to a predetermined pressure (C. 5 Lines 40-60);

It would have been obvious to one having ordinary skill in the art of vacuum pumps at the time of the invention to use an ejector pump as taught by Olsen in

the system and method taught by Maher and modified by Stones in order to avoid contamination from an oil lubricated pump, C. 2 Lines 20-30;

Response to Arguments

Applicant's arguments filed 03/30/2009 have been fully considered but they are not persuasive with respect to the Breaux and Stones references as applied to claims 1 and 8.

Applicant's further arguments with respect to claims 1-17 have been considered but are moot in view of the new ground(s) of rejection.

With respect to the applicant's arguments pertaining to the combination of Breaux with Stones, the examiner strongly disagrees. Firstly, the applicant states repeatedly that Breaux teaches away from the combination and cites cost and complexity as the reason. However, upon further examination of the Breaux patent it is unclear as to where Breaux cost/complexity are mentioned as motivating factors in the arrangement. In fact, it appears that cost is not discussed at all. Furthermore, Breaux appears to directly teach *towards* adding a pump such as Stones that would lead to more pressure control (see C. 1 Lines 40-42 and Lines 57-58).

Applicant also argues that the combination of a turbomolecular pump and a pump such as is taught by Stones would not result in a higher level of vacuum. However C. 1 Line 57 to C. 2 Line 14 of Stones teaches that hybrid pumps including these stages

are a known device, and that the compounding of the stages produces more vacuum. Furthermore, it is common in compound/hybrid turbo pumps to have a single shaft to drive multiple stages, as is taught in the figures of Stones. The combination of a turbomolecular stage with the pump of Stones would not lead one of ordinary skill in the art to add another shaft; rather, as Stones already shows two stages being driven by a single shaft, it would be obvious to apply the same principals in adding another stage.

As to the complexity of combining a turbo stage with other stages, it appears that Stones suggests (in C. 1 Lines 57-65) that large hybrid vacuum pumps are a known arrangement. In addition, the limitations of claim 1 only require that a backing stage be added to the pump of Breaux, and as Stones teaches the benefits of a backing mechanism in compound pumps, it would be an obvious addition to the pump of Breaux.

Conclusion

The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

THIS ACTION IS MADE FINAL. Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).

A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within

TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the mailing date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to CHRISTOPHER BOBISH whose telephone number is (571)270-5289. The examiner can normally be reached on Monday through Thursday, 7:30 - 6:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Devon Kramer can be reached on (571)272-7118. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Christopher Bobish/
Examiner, Art Unit 3746

/Devon C Kramer/
Supervisory Patent Examiner, Art Unit 3746

/C. B./
Examiner, Art Unit 3746